

## TRANSPORTATION IN THE UNITED STATES.

By LEWIS M. HAUPT.

(Read April 19, 1907.)

When, in the early dawn of Friday, October 12, 1492, the natives of the Isla Guanahani, saw three phantom caravels bearing down upon their homes, it is said, they were so amazed that they ran to cover and exclaimed, "*Nous sommes Decouvert.*"

Possession was immediately assumed by Columbus in the name of Spain and the possibility of thus acquiring great wealth and dominion by the right of discovery, stimulated many adventurers to cross the Atlantic, but no permanent settlements were effected until the Spanish established a colony at St. Augustine, Florida, August 28, 1565, and the English at Jamestown, Virginia, under Captain John Smith. in April, 1607.

Then followed several centuries of colonial governments with their incidental contests for trade and territory and confiscation of native right until the conditions became so intolerable as to compel a confederation for mutual defense which finally led to the formation of the republic on the seventeenth day of September, 1787.

Up to this date, the resources of the country being exhausted by war, and the population greatly scattered, little attention could be given to any general plan for the conduct of domestic commerce although a few of the states had made explorations and granted charters for the building of canals and the improvement of rivers.

One of the earliest of these was the project endorsed by the American Philosophical Society, for the creation of a waterway between the lakes and the seaboard, which was surveyed and recommended by Provost Wm. Smith and David Rittenhouse, both of this Society, in 1770, leading to the construction of the Schuylkill and Susquehanna Canal some years after. In 1785 Washington was made President of the Potomac Company to connect the Chesapeake Bay with the Ohio River and on January 5, of the following year, the James River and Kanahwa Canal was incorporated.

The discovery of coal in Pennsylvania in 1792 greatly stimulated the opening of canals in the middle and eastern states under corporate control, and in a few instances the government became interested by subscribing to the stock of the companies, as in the case of the Dismal Swamp, the Chesapeake and Delaware, the Louisville and Portland canals.

Thus fostered and encouraged the mileage of the canals increased rapidly and on safe commercial routes, so that up to the date of the Civil War there were over 5,000 miles in operation estimated to have cost \$150,000,000 while in the same time the general government had expended less than \$15,000,000 on its waterways.

With the incoming railroad epoch, in 1830, the trend of investments changed and as the roads soon discovered their inability to compete with the cheaper water routes, maintained by the states, and also to pay a tax on their tonnage, a war of extermination was waged and in time these ancient servitors of the public were forced to the wall.

These primitive railways, operated at first by horses and later by small wood-burning engines, followed the canal routes as being those of least resistance and greatest traffic, but carried very little freight, and efforts were made to restrict their business exclusively to passengers, but it was not successful.

Thus along the line of the Erie Canal there were nine independent railroads; the first of which extended from Albany to Schenectady, opened in September, 1831, or six years after the canal. These links were subsequently united and in 1851 the Hudson River road was completed and an all rail connection made over this route with the lakes.

Similarly the Pennsylvania Railroad was built from Columbia up the Susquehanna and Juniata to Hollidaysburg, thence crossing the mountain on the old Portage Railroad to the Conemaugh at Johnstown and thence to Pittsburg via the Kiskiminitas and Allegheny. The total distance from Philadelphia was about 395 miles by this route. The railroad was opened through to Pittsburg, December 10, 1852, and soon after, the improvement of the Ohio was urged by the president of the company as the best method of increasing the traffic of his lines.

The Baltimore and Ohio was also pressed westward along the Potomac, following closely the lines of the Chesapeake and Ohio Canal to Pittsburgh and Wheeling, which latter was completed in 1851 at a cost of \$11,071,000. The railroad was opened to Harper's Ferry, 82 miles, in 1834 at a cost of \$4,000,000. When extended to Chicago, 795 miles, the capital reached \$57,000,000.

The Delaware and Raritan Canal, which was controlled by Commodore Stockton, was so bitterly opposed by John Stevens who was applying for a charter for the Camden and Amboy Railroad that it was found only possible to secure either by a consolidation of the two companies requiring both to be completed and opened at the same time.

From these early beginnings the contest between the two systems for the internal traffic of the country waxed warm and the higher speed and greater latitude of the railroads enabled them to tap the business at its sources and retain it at the expense of the canals. Frequently where this could not be done, the canals were leased for long periods of years and the tonnage diverted even at a heavy charge for the maintenance of the canal. Such leases by common carriers, exercising the rights of eminent domain, should never have been authorized as they are clearly against the public interest and in restraint of trade.

So rapidly has this extermination of the waterways proceeded that in this great commonwealth where there were 1,084,87 miles in operation, in 1872, it was reduced to only 217 miles (as reported by the census of 1889) while the last report of the Secretary of Internal Affairs states: "At the time of the sale of the public works many years ago, it was in the contract of the sale that the canals should be kept open by the purchaser for the convenience of the people in the transportation of their productions."

"The canal of Pennsylvania is a reminiscence. It is not easy to discover the bed of the old canal. The levelling process is rapidly filling up its trenches and the young growth of timber has obscured its location." Then follows the very significant remark that: "The average receipts per ton mile upon all the railroads are very much lower than they were when the canals of Pennsylvania were all in operation," and also the average rates on the New York

Central and Hudson River Railroad which is in competition with the enlarged Erie Canal, are so much higher than those on the Pennsylvania Railroad, that had the latter been able to charge the New York rates on the business of last year, "its increase in freight revenue alone would have been upwards of six and a half million dollars."

From which it is concluded that Pennsylvania does not need canals to secure low rates.

These data point inevitably to the fact that because of her waterway the state of New York is enabled to secure a lower rate on a large part of her crude materials, and supply her mills and factories without requiring the railroads to carry so much of this class, at about cost, to keep the wheels of industry in motion, and that in consequence the railroads have a larger tonnage of higher class freight and are making more money. Under this exhibit would it not be good policy for the railroads of Pennsylvania to expend some six millions annually for a few years to enable them to increase their revenues permanently by not less than that amount? In fact a prominent official stated only last week that what Pennsylvania needed most for transportation was the restoration of her abandoned canals.

There is an inherent difference between the railroad and other systems of transportation which enables its managers to control it absolutely, and although it is supposed to be built by public funds under state and government laws, the public has little or nothing to say as to its policy or control. In fact, its own board is never sure it has the control of its property, if large blocks of its securities are on the market. But the particular feature to which attention is directed is the impossibility of any one shipping his own goods, in his own vehicle, and at his own convenience as is the case with a waterway, or a road. This feature makes it possible to so control the movements of freight as to have led in the past to many and serious irregularities, discrimination, rebates, special charges for terminal facilities, demurrage, warehousing, failures to supply cars, and many other acts in restraint of trade.

The railroads should be regarded as a public trust and not a device for the acquisition of great wealth for those in control. It

is also unwise to attempt to fix rates by legislation since the physical conditions, traffic and character of business and population are the principal elements in the adjusting of tolls which can best be determined by the integrity of the officers in charge.

In a recent lecture on railroad safety devices, Mr. J. C. Irwin, superintendent of construction of the New York Central Railroad stated that "the tremendous prosperity in this country is certainly the cause of the chief troubles in the operation of our roads at the present time. The traffic has increased so rapidly that the efforts to increase facilities have not been able to keep up with it. The increase in trackage has been almost nothing in comparison to the tremendous increase in freight tonnage. The large expenditures for modern freight yards have often resulted in little more than additional storage room for cars, mainly from lack of sufficient main line trackage or of properly located warehouse facilities. This overwhelming business has also manifested itself in the demoralization of the operating force. The rates of pay have been constantly increased yet the demand for skilled labor makes it almost impossible to get enough good men for the service."

This is not a recent discovery, however, for as long ago as 1892 the president of the Pennsylvania Railroad stated that there was then a larger amount of tonnage tendered to the railways than they were properly able to handle, while at the same time the competition between the transportation lines of the country was more active and the traffic carried at lower rates than at any other period of their history. From these statements it should not be expected that relief will be secured by legislation reducing the maximum tariffs as this would have the double effect of driving some of the smaller lines out of business and also increasing the tonnage on those that remained, resulting in greater delays and risks.

To ascertain just where the weak spot is located an analysis has been prepared of the most important elements of this problem showing the increments of population, tonnage, trackage, equipment and yardage, from which it appears that the railroads are absolutely unable to meet the present demands of traffic, with no possibility of providing for the future excepting by a radical modification of their policy of absorption, by the substitution therefor

of one of segregation and dispersion to the waterways, as soon as they may be put in condition for the traffic which has been diverted for so many years, and for the maintenance of which the National appropriations, although large, have been wholly inadequate and inefficient.

Mr. J. J. Hill has repeatedly shown so forcefully the impossibility of meeting the demand for the additional trackage that it is hardly necessary to reiterate, save for the record. He said "The traffic of the country is congested beyond imagination. The commerce of the country is paralyzed, and continued, it means slow death." The money required to restore the equilibrium would be more than double the whole amount in circulation and the entire capacity of all the rolling mills could not furnish the stock even if the men and the money were at hand. This is certainly a critical condition and so he recommends a canal down the Mississippi valley from St. Louis to the gulf, as a measure of relief. Has this great and experienced railroad president drawn on his imagination? Far from it he has pointed out the only possible remedy which the physics of the country affords, namely the subdivision into trunk line water routes with short tributary rail deliveries to numerous local points of distribution, and the substitution of the vessels of much larger capacity for the small car-units which cannot be handled to advantage. The system must also be one which can be operated throughout the entire year and therefore its outlets should be in latitudes below the winter frosts, as much as possible.

But to return to the data and their deductions, and for convenience arranging them in tabular form for the decade 1895-1905, there follows:

## ELEMENTS OF THE TRANSPORTATION PROBLEM.

## Population.

	1895	1905	Increase.	Per Cent.
United States.	69,500,000	86,100,000	16,600,000	23.5
Single track.	177,746	216,973	39,227	22
2d, 3d and 4th track.	12,348	19,881	6,533	53
Yards and sidings.	43,181	69,941	26,760	62
Total tracks.	233,275	306,796	73,521	31

## Tonnage Carried.

Tons.	755,799,883	1,435,321,748	679,521,865	90
Ton-miles, etc.	83,567,770,801	187,375,621,537	98,807,850,736	111-
Tons per mile.	4,362	6,681	2,418	57

## Rolling Stock.

Locomotives.	36,610	49,616	13,006	35
Freight cars.	1,230,798	1,757,105	526,307	43
Tractive Power.	13,700	28,700	15,000	109

Freight car capacity increased over				120
Tons per capita.	10	15	5	50
Tons-miles capita.	1,160	1,000	840	72

Thus while the mileage has not even kept pace with the increase of population the tonnage has multiplied five fold. This has been met by increasing the number and capacity of the freight cars as well as the weight and tractive power of engines, requiring in many instances large expenditures for betterments in track and equipment.

But still the cars accumulate in yards and sidings and it is found that while the actual average haul of 130 miles can readily be covered in eight hours after the train is made up that the delays in the loading, unloading, assorting and storing of these multitudinous units requires from six to eight days which reduces the actual efficiency down to only about six per cent. To increase the number or capacity of the cars would not relieve the congestion, but as about one half of the tonnage is coal and ore it would be greatly simplified if these products were carried on the restored water channels which they once followed at lesser cost to the consumers.

It is worthy of note that this enormous railroad system for the carriage of interstate commerce, has been developed mainly by the contributions of moneys from public and private investors, amounting to more than sixteen and a quarter billions of dollars, entrusted to corporations, exercising the rights of eminent domain under state and national authority, and it has covered the populous sections of the country with such a ramification of roads as to leave little opportunity for additional, independent lines to be built. In the more sparsely settled west the increase is still progressing with the result of adding more traffic to the already engorged roads as

well as to the length of haul, if the present Atlantic ports are to hold the trade. But the ratio of the growth in the mileage is rapidly decreasing for in the several decades ending with the years, as stated, the percentages of increase in main line mileage was as follows:

1845, 323% ; 1855, 295% ; 1865, 291% ; 1875 111% ; 1885, 73% ;  
1895, 41% ; 1905, 21% ;

showing that the construction of track is relatively losing very rapidly, as compared with the ratio of growth in population, and especially in tonnage; for within the next generation the population of this country, which is increasing more rapidly than any other civilized nation, will have doubled.

The total tons of freight carried on all lines in 1905 was 1,435,321,748 carried at an average charge of 0.784 cents making the total tax paid for rail transportation per ton for the average distance of 130.4 miles amount to \$1,469,518,157. The cost of handling this freight before and after reaching the railroads is no doubt as much more, and in addition there are many other charges to be met between the producer and consumer, so that the total tax on overland commerce is probably not far from \$3,000,000,000 annually.

Very great economies might be effected if any considerable amount of this traffic were carried by water and the average rail haul were reduced. Unfortunately the internal channels are not available, although the government has been struggling with this problem for over forty years and in some instances for nearly a century and a brief analysis of progress seems to be necessary as a guide to future possibilities. For this purpose the best authorities are the official reports of the departments and the records of Congress as to expenditures and results. Numerous organizations have sprung up all over the country demanding far greater liberality from the national government for waterway improvements and the president of the National Waterways Congress who is himself an aggressive member of the House Committee on Rivers and Harbors, in a recent speech, said in substance:

“Some of our most worthy projects have been under way for a great many years and are still far from completion. He then cites the Harlem River, under the shadow of Wall Street under



consideration for 28 years at an estimated cost of only 2,700,000, less than half of which is expended, yet the commerce passing last year was estimated at more than \$270,000,000. Over twenty years ago Congress began the opening of the Warrior and Tombigbee rivers to the greatest coal mines on earth. The improvement was estimated to cost \$3,000,000; it has subsequently been modified and the estimate doubled, so that it will be many years before it is completed and made available.

The subject of improving the Ohio has been under consideration for more than a century. In 1817-18 the state of Pennsylvania began work to be carried as far as Wheeling. In 1835 Congress applied \$550,000 to the river for the 600 miles above the falls at Louisville, and began removing snags and rocks but abandoned it after a few years. The Pennsylvania Railroad organized a corporation to effect its improvement but the government intervened as with other parties and it was not until 1875-6 that the system of movable dams was finally determined upon for this stream and work commenced by the government, in an effort to secure a six-foot stage by such structures, at an estimated cost of some \$50,000,000. "It has proceeded with a snail's pace," said Mr. Rausdell. "Out of 52 locks of this system only six have been completed and four others are in process of construction. The project has been changed to one of 9 feet and the estimate increased to \$63,000,000. If this gigantic and most meritorious work is continued at the same rate as for the past thirty years it will not be closed at the end of this century."

Long before that date the traffic will be demanding not less than 14-feet, as Chicago is now doing from the lake to the gulf, and as the state of New York demands to hold her trade against the enterprising Canadians who have so wisely enlarged their St. Lawrence canals to over 20 feet and are now proposing the Georgian-Bay-Ottawa route to save still greater distances and costs.

After enormous expenditures in efforts to deepen the Mississippi and frequent changes of plans and personnel there is a possible gain of three feet in the depths below Cairo, secured by the transient method of hydraulic dredging, which does not remove the sediment from the bed but merely shifts it from the shoals for the time

being, requiring a large plant to be maintained for use during low stages only.

The total expenditures of the Government for works of this class since the Civil War have exceeded \$545,000,000 which, with the exception of the 20-foot channel in the Great Lakes, has effected no commensurate result and there would appear to be no possible relief in sight under the jurisdiction of the present régime for many years. Certainly no corporate body could hold its own under such an exhibit of expenditures and results. There appears to be but one solution, namely, a return to the early policy under which the waterways of the country were developed by corporations holding state or national charters, when there was little difficulty in securing capital for the local improvements under control of competent local directors, familiar with the needs of their people. The hopelessness of getting the Ohio River open for the greatest manufacturing district in this country, if not in the world, within a reasonable time has stimulated many of Pittsburgh's most enterprising and far-sighted citizens to apply for state and national charters to construct a ship-canal across the lake divide so as to secure a 14-foot water communication with the outer world as soon as practicable. Although no national aid was sought, it took about ten years merely to obtain this consent, but now the project is fairly on its feet, so far as the rights are concerned it should prove to be one of the most valuable and important adjuncts in relieving the engorgement of that section, and be pushed with all possible dispatch to completion. As it is but little more than 100 miles across this lowest divide, the work should be completed in about six years.

In view of the past experience of the improvement of our rivers and harbors under national control it is an undeniable fact that the progress is interminably slow and the results unsatisfactory. The trunk lines are barely improved at all, after more than fifty years of operation, and other isolated improvements are of little or no avail for general transportation purposes. Some of the harbors have been deepened after enormously heavy expenditures made for jetties which did not improve but were auxiliary to dredging, which must be relied upon with increasing expenditure for maintenance. Our own river, the Delaware, has not yet secured a 26-foot channel

at mean low water, nor is the harbor at its mouth a satisfactory refuge for large vessels. The great harbor of New York has but 30-feet at low water and vessels are obliged to await the tides to cross the bar while all the large dredging contractors have withdrawn their plants from the works.

In short it is hopeless to look for relief from this source, for the entire works of the country, and it is essential that the states should again resume their sovereignties and authorize corporations to make the much needed improvements within their borders and also compel the surrender of long time leases where the traffic has been withdrawn, so that manufacturers and others may again receive fuel and raw-material at water rates and with much greater dispatch.

One firm in the Pittsburg district thus saves nearly \$1,000,000 annually on its coal bill alone because of the Monongahela River rates by water.

The Internal Improvement Commission of Illinois closes a very strong appeal for the opening of the lakes and gulf waterway in these practical and timely words:

“There is every reason for the State of Illinois to earnestly lead in the promotion of a National Waterway policy, and there is also reason for her to set an example to sister states in a domestic waterway development. When the United States has adopted a systematic policy, we must expect the national function to be restricted to the broad outlines and arteries of a system and that local waterways and ports will be relegated to the states. Meantime it may be worth while to consider whether the state of Illinois, should not undertake the development of the route through the state, receiving from the United States such subsidy as it may choose to give. There may be hidden wisdom in such self-reliance as has marked the state of New York, and it may be that the influence of two such states will be sufficient to lead the Federal government into a National Waterway policy.”

The committee might have added that Massachusetts, New York, Pennsylvania and Ohio are also moving along the same lines in the inauguration of their great works independently of government aid and, in some cases, exercising the right to collect tolls from the trade, as on all railroad-transportation routes under corporate control.

Twenty-two years ago it was reported to Congress that “The manifest destiny of the country points unerringly to the emancipation of the waterways as the next great work, not of war but of peace.” Why is it not yet accomplished?